

Full Paper

方解石碳酸钙形成过程和热力学性质的研究

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摘要 将CaCl₂和Na₂CO₃水溶液在强烈搅拌下快速混合, 制备了碳酸钙。应用SEM、FT-IR和XRD对所制备的样品进行了表征。结果表明, 在反应10 s后生成了稳定的方解石型和不稳定的球霏石型碳酸钙。随着反应时间的进行, 样品颗粒增大, 球霏石逐渐转化为方解石。在反应180min, 样品全部转化为方解石。用全自动绝热量热计测试了制备的方解石在80至390 K温区的等压摩尔热容。建立了其等压摩尔热容与温度的定量关系。根据热力学函数关系式, 计算了方解石样品的焓、熵和吉布斯自由能。

关键词 [方解石, 球霏石, 晶型, 热容](#)

分类号

Formation Process and Thermodynamic Properties of Calcite

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Abstract The fast mixing of aqueous solutions of calcium chloride and sodium carbonate resulted in crystalline forms of vaterite and calcite under vigorous stirring. Then, the vaterite was transformed to pure calcite within about 180 min. The crystalline forms all grew with experimental time increase. Scanning electron microscopy (SEM), Fourier transform infrared spectroscopy (FT-IR), and X-ray diffraction spectroscopy (XRD) techniques were employed to characterize the as-prepared samples. The heat capacity of the stable as-synthesized calcite was determined by means of an adiabatic calorimeter from 80 to 390 K. The thermodynamic functions of the calcite were derived based on the relationships among the thermodynamic functions and the function of the measured heat capacity with respect to temperature.

Key words [calcite](#) [vaterite](#) [crystalline form](#) [heat capacity](#)

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